

Evaluation of native and traditional turfgrass species for low maintenance lawns

Authors: Thomas Salaiz, Support Scientist, University of Idaho
Dr. Stephen Love, Horticulturist, University of Idaho
Aberdeen R & E Center, 1693 S 2700 W, Aberdeen, ID 83210;
(208-397-4181); tsalaiz@uidaho.edu

RECEIVED
DEC 31 2009
PLANT INDUSTRIES

Date: December 30, 2009

Objectives: The goal of this research is to determine the adaptation potential of several low-maintenance turfgrass species and mixtures to southern Idaho over two years of a low maintenance regime.

Methods

In the spring of 2009, half of the plots were left un-mowed and the other half mowed at a height of 3.5 inches. This is the same mowing treatment that was followed in 2008. This year, the mowing treatments were changed in order to evaluate the grasses at two mowing heights. The 2009 mowing regime included 3 and 4 inch mowing heights and was imposed on July 17. The portion of the plot that previously was left un-mowed was maintained at the new treatment height of 4 inches. These two mowing heights represent medium to high mowing heights that would be expected for a low maintenance regime. As expected, the half of the plot that had previously been left un-mowed, upon mowing at 4 inches, suffered severe scalping injury and a very thin stand. Most grasses eventually recovered from the severe mowing damage, however this was not attained until fall. Mowing effects reported here include mowing vs. un-mowed, due to the lack of full recovery from new mowing treatments.

Plots have been irrigated at 60 % ET replacement. No fertilizer was applied in 2009. The entire plot area was sprayed with Trimec herbicide for broadleaf weed control.



Overview of turf plots on August 5, 2009.

2nd YEAR RESULTS & DISCUSSION

Traditional Turfgrass Species

Bluegrasses. The KBG blend, ‘Nugget,’ ‘Wildhorse,’ ‘Midnight,’ and ‘Avalanche,’ and hybrid bluegrass performed very similarly with respect to season long color and quality (Tables 1 and 2). Both bluegrasses experienced some mid-summer dormancy as evident by the low color and quality scores in July and August. The increased heat resistance reported for hybrid bluegrasses at other locations across the U.S. did not seem to improve green color retention or reduced summer dormancy in our trial. The KBG blend performed quite well under the 60% ET replacement irrigation imposed in this study. Even compared to grasses normally considered extremely drought resistant, KBG had higher color and quality ratings during mid-summer. Under non-mowed conditions, the lack of seed head production for both bluegrasses resulted in little improvement in quality scores (Table 4). In an un-mowed situation, the bluegrasses would lend a “wavy” appearance to a native-type lawn, however, this was considered slightly less desirable than the quality gained with the presence of seed heads.

Tall Fescue. The tall fescue blend, ‘Coyote II,’ ‘Fidelity,’ and ‘GreensKeeper’, performed very well under the low irrigation regime of this trial. It is well documented in the literature that tall fescue is the deepest rooting cool-season turfgrass. This characteristic allows tall fescue to maintain green color longer during a drought due to its ability to extract water from deep soil depths. This was evident in this study as green color was maintained well into summer, exceeded only by the warm-season grasses, buffalograss and blue grama (Table 1). The wide blades of tall fescue result in a relatively poor quality turf at the mowing heights in this study (Table 2). In the un-mowed situation tall fescue performed very well as the seed heads provided an attractive visual (Table 4). Leaving tall fescue un-mowed early in the season resulted in more leaf area and hence a greener color (Table 3).

Fine Fescues. All the traditional fine fescues (chewings, hard, creeping red, and sheep) performed relatively well, although they also exhibited a fair amount of summer dormancy as indicated by the decrease in color in late July into August (Table 1). Sheep fescue showed the earliest green-up of all the fine fescues, however, as the season progressed, sheep fescue ranked lowest in green color. This decrease in color for the fine fescues also was coupled with a decrease in quality starting in July (Table 2). This decrease in color and quality is related to the low heat tolerance and subsequent summer dormancy. It should be noted, however, that the fine fescues provided higher color and quality than the wheatgrasses during the heat of the summer (Tables 1 and 2). A large increase in quality was seen when the fine fescues were left un-mowed, due to the attractive seed-heads (Table 4). As with tall fescue, the fine fescues provided a darker color early in the season when left un-mowed due to the increase in leaf area (Table 3).



Top: Creeping red fescue; Middle: Tall fescue; Bottom: Buffalograss.
Picture taken August 5, 2009

Non-traditional Turfgrass Species

Idaho Fescues. Although part of the larger fine fescue complex, Idaho fescue (*Festuca idahoensis*), native to North America, did not perform as well as the more traditional turfgrass fine fescues. Color and quality were lower than all the fine fescues throughout the growing season and they also reached much lower color and quality scores as they entered summer dormancy (Tables 1 and 2). Leaving the Idaho fescues un-mowed helped increase green color early in the season, and quality was substantially increased due to the very attractive seed-heads (Tables 3 and 4). The seed heads are particularly attractive with reddish stems.

Wheatgrasses. The wheatgrasses did not compare to traditional cool-season grasses in terms of color or quality by the July rating date (Tables 1 and 2). The ability of these grasses to survive extreme drought by entering dormancy early in the summer causes these grasses to lose color and provide a dry, 'stemmy' cover unacceptable for turf purposes. By September, many of the wheatgrasses had sufficiently emerged from summer dormancy so that they were comparable to the traditional cool-season grasses in terms of color but quality was still lower due to low turf density. Interestingly, the mixture of western wheatgrass with blue grama, a warm-season grass, provided slightly greener color early in the season than the warm-season grasses alone, suggesting that such a mixture may provide acceptable turfgrass quality in a low-maintenance situation. Additional research with varying percentages of these and other grasses may be warranted. Siberian wheatgrass maintained green color longer into the summer and emerged from summer dormancy earlier than the other wheatgrasses in the study, but it is unclear whether this, along with the tendency for leaf shredding, will make this an acceptable turfgrass option. In a native, un-mowed situation, all the wheatgrasses will provide an excellent cover as they

provide attractive seed-heads (Table 4). Color also was higher when left un-mowed due partly to increased leaf area, and partly to the lack of leaf shredding (Table 3).

Blue Grama and Buffalograss. Both blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*) are warm-season grasses native to North America. By the end of the 2008 growing season, the blue grama seemed to be providing acceptable turf density and quality, but the buffalograsses, especially the vegetatively propagated varieties, were having problems providing enough ground cover to adequately compete against weeds (2008 Final Report). The warm-season grass plots were sprayed with roundup during the early winter of 2008 and additional weeds were hand-rogued in early 2009 in order to better evaluate turfgrass quality. All the warm-season grasses were still very dormant at the May 13 rating date (Table 1). Blue grama broke winter dormancy earliest of the warm-season grasses, reaching good color by June 9, 2009. The buffalograsses were still at the early stages of breaking dormancy on June 9. By June 30, all warm-season grasses had broken dormancy. The warm-season grasses ranked at or near the top in green color through late August, when the fine fescues began to break their summer dormancy. By late September, the warm-season grasses were beginning to enter winter dormancy and quickly losing color.



Top: Siberian wheatgrass; Middle: Buffalograss; Bottom: Western wheatgrass.
Picture taken August 5, 2009.

The warm-season grasses responded to mowing by greening up earlier under the mowing regime due possibly to increased soil temperatures as a result of increased incoming solar radiation (Table 3). This effect was not seen with the cool-season grasses as they are well adapted to colder air and soil temperatures and had begun green-up much earlier and were relatively unaffected by the mowing regime at this time of the year.

Mixing blue-grama with buffalograss provided a dense, attractive turf, but additional observation is needed to determine if the mixture provides an advantage over the individual components alone. Mixing blue-grama with western wheatgrass provides an interesting turf as the warm-

season component provides green color in mid-summer when the wheatgrass is dormant, and the wheatgrass provides earlier green-up in the spring and green color later into the fall than the blue grama component would have alone. Additional work is warranted with similar mixtures and management regimes.



Top: Buffalograss + Blue Grama; Middle: Streambank wheatgrass; Bottom: Blue Grama + Western wheatgrass. Picture taken August 5, 2009.

Prairie Junegrass and Muttongrass. Both prairie junegrass (*Koeleria macrantha*) and muttongrass (*Poa fendleriana*), native to North America and adapted to dry climates, have performed poorly in this trial. The junegrass variety ‘Barkoel’, known as “Turtleurf”, has performed better than muttongrass with respect to both color and quality (Tables 1 and 2). Junegrass provided acceptable quality through late June and had higher quality than the Idaho fescues and the wheatgrasses in mid-summer as it does not seem to enter into a summer dormancy. Both of these grasses have performed quite poorly to date in our trial due mainly to the extremely slow germination and establishment rates (Tables 1 and 2). The very slow growth rate of junegrass makes this variety particularly interesting with good potential for low maintenance lawns. Additional work is needed, however, to deal with the poor germination and slow establishment.

Muttongrass, however, provided a very poor quality turf due primarily to the extreme bunch-type growth habit. This may be overcome with better establishment methods however, since other grasses with bunch-type growth habits are currently available, it is not clear whether this grass provides any added benefit to continue investigation as a low maintenance turf. Many of the fine fescues provide the early green up and slow growth rates that muttongrass provides, with the added benefit of good germination, establishment and overall good turf quality. Muttongrass does have a very attractive seed-head with variable color, which could provide visual interest in a native type planting mix, however, seed costs and establishment will likely limit its use for this purpose.

Mowing Effects

As mentioned in the discussion of individual grasses above, mowing regimes had a profound effect on quality and spring green up for many of the grasses. The fine fescues, wheatgrasses, and muttongrass have attractive seedheads and when left in an un-mowed situation provide an attractive meadow-like effect. This affect can be seen in table 4 as the un-mowed regime provided an increase in quality for most of the grasses. This affect was larger for the wheatgrasses at the June 8 rating date than for the other grasses due in part to the tall, slender seed stalks of these grasses. This affect was not realized for the warm-season grasses due mainly to the fact that these grasses had not produced a seed-stalk by the end of June, except somewhat for blue grama. These warm-season grasses produce seed stalks later in July and the mowing regimes were changed in early July to begin observation of the grasses under two mowing heights, which will be carried into 2010.

The mowing versus no-mowing regime also had the effect of improving spring green-up for the warm-season grasses as seen in the June color ratings (Table 3). This information is very insightful and lends valuable information for managing these grasses in our short-season climates. A second year of data at two mowing heights will help us determine if this effect can be seen by varying the mowing height early in the season.

Expenditure Report

The award for this work totaled \$5. The majority of this has been used for summer hourly help. Additionally, some has been used for fuel, herbicides and plot marking supplies.

Table 1. Color ratings for grass species during the 2009 growing season at the Aberdeen R&E Center. Color ratings based on a 1-9 scale with 1 = straw brown turf; 9 = deep, dark green turf.

Grass Species	3/20/09	5/13/09	6/9/09	6/30/09	7/20/09	8/6/09	8/20/09	9/21/09
	----- Color (1-9 scale) -----							
Kentucky bluegrass	2.0	5.0	6.6	6.5	5.5	5.8	4.9	5.3
Hybrid bluegrass	2.0	5.0	6.4	6.1	5.1	5.6	4.9	5.8
Tall fescue blend	2.0	5.8	7.8	7.9	6.1	6.1	5.8	7.4
Creeping red fescue	2.0	4.9	7.4	6.1	4.8	5.0	5.4	5.8
Chewings fescue	2.0	5.8	7.4	7.0	4.3	5.0	5.6	6.1
Hard fescue	3.0	5.3	7.6	7.3	4.8	5.8	5.5	5.9
Fine fescue mix	2.0	5.8	7.3	6.3	4.8	5.4	6.0	6.1
Sheep fescue	2.8	6.0	6.0	5.3	3.6	4.3	4.1	5.5
ID fescue 'Joseph'	2.0	5.5	5.8	5.4	2.8	2.9	3.8	5.9
ID fescue 'Nez Perce'	2.0	5.3	6.3	5.6	2.6	3.0	3.0	5.5
Crested wheatgrass	2.3	6.3	4.9	5.6	2.3	3.0	3.6	6.3
Western wheatgrass	1.8	5.3	5.4	6.3	3.3	3.6	3.6	6.0
Crested + western WG	2.3	6.5	5.3	5.8	2.4	3.5	3.6	6.0
Siberian wheatgrass	2.8	6.0	5.1	6.5	3.3	3.5	4.5	6.4
Crested + Siberian	2.3	5.6	4.9	6.3	2.6	2.5	3.5	6.4
Streambank wheatgrass	1.0	4.6	5.0	4.9	3.3	3.5	4.1	5.1
Blue grama	1.0	1.0	6.4	6.6	5.5	7.0	5.4	4.3
Blue grama + western WG	1.0	3.3	6.4	7.1	4.9	6.1	5.8	5.5
Buffalograss 'Top Gun'	1.0	1.0	3.1	7.3	7.3	7.1	6.1	5.8
Buffalo + blue grama	1.0	1.0	5.9	7.4	6.4	6.4	5.1	4.3
Buffalograss 'Legacy'	1.0	1.0	2.1	6.5	7.4	6.8	6.5	5.6
Buffalograss 'Prestige'	1.3	1.0	1.9	6.8	7.3	6.4	6.4	5.5
Prairie Junegrass	1.3	5.1	7.3	7.0	5.5	4.9	4.0	5.0
Muttongrass	2.8	3.9	6.5	6.1	3.8	5.1	4.5	5.3
LSD (0.05)	0.4	0.6	0.7	0.6	0.9	0.7	0.9	0.8

Table 2. Quality ratings for grass species during the 2009 growing season at the Aberdeen R&E Center. Quality ratings based on a 1-9 score with 1 = very poor, thin, yellow turf; 6 = minimally acceptable turf; 9 = excellent turf with good density, color and uniformity.

Grass Species	6/9/09	6/30/09	7/20/09	8/6/09	8/20/09	9/21/09
Kentucky bluegrass	6.1	6.5	5.0	5.5	5.1	4.8
Hybrid bluegrass	6.3	6.4	4.8	4.9	4.9	4.9
Tall fescue blend	6.5	7.5	4.8	5.0	5.0	5.1
Creeping red fescue	6.8	7.3	4.5	4.9	5.0	5.0
Chewings fescue	6.9	8.1	4.5	4.5	5.0	5.1
Hard fescue	7.4	7.0	4.8	5.1	4.6	5.0
Fine fescue mix	6.8	7.5	4.4	5.1	5.4	5.4
Sheep fescue	5.9	5.3	3.9	4.0	4.1	4.3
ID fescue 'Joseph'	5.6	5.5	2.5	2.6	2.6	3.3
ID fescue 'Nez Perce'	5.3	5.5	3.0	2.6	2.9	2.9
Crested wheatgrass	5.3	5.4	2.3	2.5	3.1	3.4
Western wheatgrass	4.8	5.6	2.4	2.6	3.3	3.1
Crested + western WG	5.3	5.9	2.5	2.8	3.4	3.8
Siberian wheatgrass	5.4	6.3	2.0	3.1	3.6	3.6
Crested + Siberian	4.9	5.9	2.1	2.3	3.1	3.5
Streambank wheatgrass	5.5	5.4	3.5	3.5	4.3	3.9
Blue grama	5.8	6.8	4.9	5.1	5.3	4.1
Blue grama + western WG	5.6	6.8	4.0	4.6	5.1	4.6
Buffalograss 'Top Gun'	1.6	5.8	5.5	5.4	5.3	4.6
Buffalo + blue grama	5.1	6.9	5.3	6.4	5.4	4.8
Buffalograss 'Legacy'	1.6	4.8	5.4	5.9	5.6	4.5
Buffalograss 'Prestige'	1.4	4.5	5.3	5.1	5.0	4.3
Prairie Junegrass	5.9	6.6	4.4	4.6	4.0	4.3
Muttongrass	4.4	5.5	2.5	3.0	2.9	2.9
LSD (0.05)	0.9	0.7	0.6	0.7	0.6	0.9

Table 3. Color response of grasses to differential mowing regimes at two rating dates during 2009 in Aberdeen, ID.

Grass Species	6/09/09		6/30/09	
	Mowed	Un-mowed	Mowed	Un-mowed
	----- Color Rating (1-9) -----			
Kentucky bluegrass	6.3	7.0	6.0	7.0
Hybrid bluegrass	6.0	6.8	5.8	6.5
Tall fescue blend	7.0	8.5	7.0	8.8
Creeping red fescue	7.0	7.8	5.5	6.8
Chewings fescue	6.8	8.0	6.5	7.5
Hard fescue	7.3	8.0	6.5	8.0
Fine fescue mix	7.0	7.5	5.5	7.0
Sheep fescue	5.8	6.3	4.3	6.3
ID fescue 'Joseph'	4.5	7.0	3.8	7.0
ID fescue 'Nez Perce'	5.5	7.0	3.5	7.8
Crested wheatgrass	3.0	6.8	4.0	7.3
Western wheatgrass	4.0	6.8	5.3	7.3
Crested + western WG	3.3	7.3	4.8	6.8
Siberian wheatgrass	3.0	7.3	5.3	7.8
Crested + Siberian	2.8	7.0	5.0	7.5
Streambank wheatgrass	4.3	5.8	3.8	6.0
Blue grama	6.3	6.5	6.8	6.5
Blue grama + western WG	5.8	7.0	6.5	7.8
Buffalograss 'Top Gun'	3.3	3.0	7.5	7.0
Buffalo + blue grama	6.5	5.3	7.8	7.0
Buffalograss 'Legacy'	2.5	1.8	6.8	6.3
Buffalograss 'Prestige'	2.3	1.5	6.8	6.8
Prairie Junegrass	6.8	7.8	6.0	8.0
Muttongrass	6.3	6.8	5.8	6.5

Table 4. Quality response of grasses to differential mowing regimes at two rating dates during 2009 in Aberdeen, ID.

Grass Species	6/08/09		6/30/09	
	Mowed	Un-mowed	Mowed	Un-mowed
	----- Quality Rating (1-9) -----			
Kentucky bluegrass	6.0	6.3	6.8	6.3
Hybrid bluegrass	6.5	6.0	6.3	6.5
Tall fescue blend	6.5	6.5	7.3	7.8
Creeping red fescue	6.5	7.0	6.3	8.3
Chewings fescue	6.8	7.0	7.5	8.8
Hard fescue	7.3	7.5	6.0	8.0
Fine fescue mix	7.0	6.5	6.8	8.3
Sheep fescue	5.0	6.8	4.5	6.0
ID fescue 'Joseph'	3.8	7.5	3.5	7.5
ID fescue 'Nez Perce'	4.3	6.3	3.5	7.5
Crested wheatgrass	3.8	6.8	3.5	7.3
Western wheatgrass	3.8	5.8	4.3	7.0
Crested + western WG	3.8	6.8	4.8	7.0
Siberian wheatgrass	3.5	7.3	4.8	7.8
Crested + Siberian	3.0	6.8	4.5	7.3
Streambank wheatgrass	4.3	6.8	5.0	5.8
Blue grama	6.3	5.3	6.5	7.0
Blue grama + western WG	5.0	6.3	6.5	7.0
Buffalograss 'Top Gun'	2.0	1.3	5.8	5.8
Buffalo + blue grama	6.0	4.3	7.0	6.8
Buffalograss 'Legacy'	2.3	1.0	5.8	3.8
Buffalograss 'Prestige'	1.8	1.0	5.0	4.0
Prairie Junegrass	5.8	6.0	5.5	7.8
Muttongrass	3.5	5.3	3.8	7.3